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SHIPPER AND CARRIER RESPONSE TO THE OCTOBER - DECEMBER 2005 AND JANUARY – FEBRUARY 2006 LOCK 27 CLOSURES



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of Engineers®

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Navigation Economic Technologies

The purpose of the Navigation Economic Technologies (NETS) research program is to develop a standardized and defensible suite of economic tools for navigation improvement evaluation. NETS addresses specific navigation economic evaluation and modeling issues that have been raised inside and outside the Corps and is responsive to our commitment to develop and use peer-reviewed tools, techniques and procedures as expressed in the Civil Works strategic plan. The new tools and techniques developed by the NETS research program are to be based on 1) reviews of economic theory, 2) current practices across the Corps (and elsewhere), 3) data needs and availability, and 4) peer recommendations.

The NETS research program has two focus points: expansion of the body of knowledge about the economics underlying uses of the waterways; and creation of a toolbox of practical planning models, methods and techniques that can be applied to a variety of situations.

Expanding the Body of Knowledge

NETS will strive to expand the available body of knowledge about core concepts underlying navigation economic models through the development of scientific papers and reports. For example, NETS will explore how the economic benefits of building new navigation projects are affected by market conditions and/or changes in shipper behaviors, particularly decisions to switch to non-water modes of transportation. The results of such studies will help Corps planners determine whether their economic models are based on realistic premises.

Creating a Planning Toolbox

The NETS research program will develop a series of practical tools and techniques that can be used by Corps navigation planners. The centerpiece of these efforts will be a suite of simulation models. The suite will include models for forecasting international and domestic traffic flows and how they may change with project improvements. It will also include a regional traffic routing model that identifies the annual quantities from each origin and the routes used to satisfy the forecasted demand at each destination. Finally, the suite will include a microscopic event model that generates and routes individual shipments through a system from commodity origin to destination to evaluate non-structural and reliability based measures.

This suite of economic models will enable Corps planners across the country to develop consistent, accurate, useful and comparable analyses regarding the likely impact of changes to navigation infrastructure or systems.

NETS research has been accomplished by a team of academicians, contractors and Corps employees in consultation with other Federal agencies, including the US DOT and USDA; and the Corps Planning Centers of Expertise for Inland and Deep Draft Navigation.

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SHIPPER AND CARRIER RESPONSE TO THE
OCTOBER-DECEMBER 2005 LOCK 27 AUXILIARY LOCK CLOSURE
and the
JANUARY-FEBRUARY 2006 LOCK 27 MAIN LOCK CLOSURE

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SUMMARY

Lock 27, at Mississippi River Mile 185.0, is critical to navigation on the Upper Mississippi and Illinois Rivers and normally passes more than 80 million tons of commodity traffic. Between October 2005 and February 2006, the main and auxiliary lock chambers at Lock 27 were sequentially closed to navigation traffic for a planned replacement of gate operating machinery. The auxiliary lock chamber was closed for nine weeks from 17 October – 22 December 2005, and the main lock chamber was closed for seven weeks from 3 January – 25 February 2006. During the times that the auxiliary lock chamber was closed, the main lock chamber remained available to river traffic.

A survey of the shippers and carriers affected by the Lock 27 lock closures was conducted between 14 April and 12 May 2006 for the purpose of discerning industry reactions to the closures and the associated costs. In addition to the industry surveys, an analysis of the Operation and Maintenance of Navigation Installations (OMNI) data for Lock 27 was conducted by the Rock Island District. The analysis examined the detailed OMNI data for the Lock 27 facility, particularly for the closure period, to identify changes in operating procedures attributable to the closure, and to draw comparisons with the industry survey responses.

The purpose of the shipper survey was to identify industry's total economic costs and operational changes associated with the closure event. A total of 206 companies were selected to receive this survey. Recent tonnage data was not readily available for these companies, however, these shippers accounted for about 62.1 million tons of Lock 27 traffic in 2003, which was about 80 percent of total traffic. Completed survey forms were received from 44 companies, representing a response rate of 21 percent. However, a follow-up telephone campaign resulted in an additional 37 replies, increasing the overall response rate to 40 percent. Although shippers had a wide variety of reactions to the closure, 85 percent indicated that no change in procedures was necessary for their company. This was credited to ample advanced notification and the fact that this closure occurred during what is typically a slow time of year for them. Also, the auxiliary chamber remained in service which helped minimize any disruption. About 5 percent of the companies decided to stockpile product and wait for traffic to clear, and one fertilizer company switched to a different waterway routing for product delivery from existing sources. Most respondents indicated that a change in long-term transportation strategy was not required, and that no additional costs were incurred.

The major carriers using the Lock 27 facility were also surveyed during this effort. The purpose of this survey was to identify carrier reactions to the closure of the main chamber at Lock 27 and to identify economic costs and operational changes. A total of 23 companies were contacted. Completed survey forms were received from 10 companies, representing a response rate of 43 percent. Through the follow-up telephone campaign one additional response was received, increasing the overall response rate to 48 percent.

All of the responding companies indicated that notification of the scheduled closure was adequate to prepare a response plan. The majority of companies reacted to the closure by having towboats remain in the queue, or by breaking tows to lock through the auxiliary lock. Several companies participated in industry self-help as a process that was effective in dealing with the situation.

Shippers and carriers were requested, in the survey process, to provide estimates of additional costs incurred as a result of the closure events at Lock 27. Information provided was very sparse from both groups surveyed. In the shippers group, the majority of respondents indicated that no additional costs were incurred; however, two companies (one barge terminal and one petroleum products company) reported \$342,000 in additional costs. One petroleum product wholesaler reported a large impact with the loss of 25,000-30,000 barrels per day at a cost of \$10,000 per day, but the total number of days could not be obtained.

The carriers that responded to this question provided estimated total costs associated with the Lock 27 closure at \$528,825. Impacted areas were cited as delay costs for boats and barges, lock assist costs and extra labor. Three carriers provided delay cost/hour but did not report the total number of hours lost, so a total additional cost amount could not be determined. These companies were contacted for clarification of the responses, however call were not returned.

Responses were received from a variety of shipping companies and carriers but there was little feedback from the grain industry, as might be expected for this area of the Mississippi River. From the survey responses it appears that this could be related to the time of year in which the closures occurred as there is not much shipment of grain in January and February. Also, the closure of the auxiliary lock in October-December would not have much impact on grain movements since the main lock remained open. Survey respondents also indicated that with sufficient notice, short-term closures do not significantly impact business.

In addition to the survey work, an analysis of OMNI data for the closure period was undertaken to assess carrier reactions to, and the impacts of, the closure events. The results of the analysis show:

- An increase in average delay hours/tow for both closure periods. Large increase in average delay for main lock closure compared to the same period in the previous year.
- No significant change in tow size (barges per tow) during the closures.
- A slightly greater percent empty barges during both closure periods.
- No change in tonnage during the main lock closure. Slight decrease in tonnage during the auxiliary lock closure compared to the same period in the previous year.
- No significant change in tow arrival rates during the closure of the main lock. Decrease in tow arrival rate during the auxiliary lock closure.

Overall, industry responses to the 2005/2006 survey were very similar to those received for the 2004 survey. The majority of replies for both surveys indicated that the lock closures

resulted in no change in procedures and that the advanced notice to navigation interests is valuable in helping industry prepare and alleviate significant impacts to business. The following tables provide a comparison of some of the key survey responses and OMNI data for the 2004 and the 2005/2006 closure events.

Table 1
Comparison of Survey Data

	2004 Survey	2005/2006 Survey
Total annual tons thru Locks	77.5 million (2004)	68.4 million (2005)
Annual grain tonnage thru Locks	36.3 million (47% of total)	26.1 million (38% of total)
Reported costs incurred (from surveys)	\$228,000 – shippers \$3.9 million - carriers	\$126,000 – shippers \$528,800 - carriers
Advanced Notice to Navigation published	5 weeks prior	6 wks prior- auxiliary chamber 16 wks prior- main chamber
Main reaction to closure event	No change in procedures	No change in procedures

Table 2
Comparison of OMNI Data

	Closure of Main Chamber 7/27 - 8/10/04	Closure of Auxiliary Chamber 10/17 - 12/22/05	Closure of Main Chamber 1/3 - 2/25/06
Delay hours	15,110	2,376	5,617
Maximum delay hours - single day	1,770 (Aug 11)	274 (Dec 5)	375 (Feb 2)
Number of tows processed	372	1,247	825
Days to clear queue	4	1	0
Delay cost per hour *	\$347.55	\$343.66	\$343.66
Cost of delay-entire closure period	\$5,251,550	\$816,500	\$1,930,400
Delay cost per day	\$262,580	\$12,200	\$35,100

* Delay cost based on latest Corps guidance and towboat horsepower, barge type, barge/tow as recorded in OMNI.

SHIPPER AND CARRIER RESPONSE TO THE
OCTOBER-DECEMBER 2005 LOCK 27 AUXILIARY LOCK CLOSURE
and the
JANUARY-FEBRUARY 2006 LOCK 27 MAIN LOCK CLOSURE

1. INTRODUCTION

A planned replacement of gate operating machinery was scheduled for the Lock 27 main and auxiliary chambers. The auxiliary lock chamber was closed to navigation traffic between 17 October and 22 December 2005, and the main lock chamber was closed to navigation traffic between 3 January and 25 February 2006. The St. Louis District of the U.S. Army Corps of Engineers published two Navigation Notices regarding the closures. This advanced notice would allow the navigation industry to prepare for the scheduled maintenance closures.

A survey of the shippers and carriers affected by the Lock 27 main lock closure was conducted between 14 April and 12 May 2006 to determine what measures were taken by industry to mitigate the effects of the lock closures and to estimate the total costs to industry that resulted from the closure events. Since the main lock remained open while the auxiliary lock was being repaired, the impacts to shippers and towing companies resulting from the auxiliary lock closure were expected to be minimal. So as not to overburden companies with multiple surveys, the survey questions focused on the main lock closure event with a few questions regarding impacts associated with the closure of the auxiliary lock included.

This report documents the results of those industry surveys. In addition to the industry surveys, an analysis of the Operations and Maintenance of Navigation Installations (OMNI) data for Lock 27 was conducted. The purpose of this analysis was to examine the detailed OMNI data for the Lock 27 facility, particularly for the closure period, to identify changes in operating procedures attributable to the closure, and to draw comparisons with the industry survey responses.

2. PROJECT DESCRIPTION

The Lock 27 project is located at Mississippi River Mile 185.5, downstream of the St. Louis, Missouri urban area. The two locks at Lock 27 are situated at the southern end of an 8.4-mile long, man-made canal, and represented the first major addition to the original 9-Foot Channel Project. After 1940, only a single impediment prevented the maintenance of a safe and reliable 9-foot navigation channel on the Mississippi River from St. Paul, Minnesota, to New Orleans, Louisiana. This impediment, known as the Chain of Rocks Reach, was a 17-mile series of rock ledges that began just north of St. Louis and was extremely difficult and dangerous to navigate.

The Corps of Engineers designed the canal to allow river-borne vessels to bypass the treacherous Chain of Rock Reach to ensure adequate depths in the pool below the old Lock and Dam 26. The Corps of Engineers constructed a non-movable, lower water dam

extending entirely across the river. This dam is known both as Dam No. 27 and the Chain of Rocks Dam.

The project has two parallel locks along the left descending bank: a 1200' x 110' main lock chamber and a 600' x 110' auxiliary chamber. The dam is a 2,500 foot long non-movable, low water dam. The navigation pool is 27.8 miles long and covers 13,000 acres. The project was put into service in 1953.

Lock 27, a highly important link in the Upper Mississippi River Navigation System, is located at the critical transition point on the Mississippi River from a "locking river" north of St. Louis and the "open river" from St. Louis on south. The Lock 27 main chamber is one of the nation's busiest navigation lock chambers. Commodity traffic transiting Lock 27 moves to/from markets in the Gulf Coast, Florida and overseas.

Commodity traffic through the Lock 27 facility for the period 2000-2005 is displayed in Table 1. The 2005 traffic mix is dominated by grain (38.2 percent), followed by chemicals (11.7 percent), coal (11.5 percent), crude materials (11.1 percent), petroleum (8.6 percent), and steel (6.0 percent).

Table 1
Commodity Traffic 2000–2005
Lock 27 Main & Auxiliary Chambers
(Millions of Tons)

Commodity	2000	2001	2002	2003	2004	2005	% of Total 2005
Coal	7.9	7.7	7.9	8.6	8.1	7.9	11.5
Petroleum	5.4	6.6	6.3	6.6	6.7	5.9	8.6
Chemicals	8.3	8.2	8.0	8.1	8.0	8.0	11.7
Grain	40.8	38.7	43.6	36.3	27.9	26.1	38.2
Steel	4.6	3.3	3.8	3.3	3.9	4.1	6.0
Crude Materials	5.7	6.2	5.5	6.0	7.6	7.6	11.1
Others	9.9	10.4	8.6	8.6	9.0	8.8	12.9
Total	82.6	81.1	83.8	77.5	71.2	68.4	100

Source: OMNI Data

As shown in Table 2, 58 percent of the 2005 commodity traffic traveled downbound through the Lock 27 facility. The vast majority of this traffic consists of grain destined for the Lower Mississippi River and export. Upbound coal is destined for utility plants, while petroleum, chemicals and crude materials are delivered to many different industries in the middle and upper Mississippi River basin.

Table 2
2005 Commodity Traffic Through Lock 27
By Direction
Main and Auxiliary Chambers
(Millions of Tons)

Commodity	Upbound	% of Total	Downbound	% of Total	Total
Coal	6.8	24	1.1	3	7.9
Petroleum	2.4	8	3.5	9	5.9
Chemicals	6.6	23	1.4	3	8.0
Grain	0.7	2	25.4	64	26.1
Steel	3.3	12	0.8	2	4.1
Crude Materials	5.9	21	1.7	4	7.6
Others	3.0	10	5.8	15	8.8
Total	28.7	100	39.7	100	68.4

Source: OMNI Data

3. ADVANCED CLOSURE NOTIFICATIONS

The St. Louis District of the U.S. Army Corps of Engineers published two Navigation Notices regarding the sequential closing of both lock chambers. The notice indicated that the first closure would be the auxiliary chamber and the main lock chamber would remain open during that time. The notice also indicated that the second closure would be the main chamber, and all traffic would be using the auxiliary lock during that event. The towing industry was advised that the self-help program would be in effect. This advanced notice would allow the navigation industry to prepare for an expected eight-week maintenance closure followed by an expected seven week closure.

The first Navigation Notice was issued on 24 August 2005 and announced the auxiliary and main lock chambers were scheduled to close from 1 October-27 November 2005 and 3 January-1 March 2006, respectively.

The second Notice was released on 19 September 2005 and revised the closure dates for the auxiliary lock chamber to be from 17 October-13 December 2005. Closure dates for the main lock chamber remained unchanged.

Based on OMNI data, the auxiliary lock chamber was closed from 17 October-22 December 2005, an actual duration of 67 days. The main chamber was closed from 3 January – 25 February 2006, an actual duration of 54 days.

4. SHIPPER SURVEY

a. Survey Procedures. An OMB-approved Shipper Survey (Control #0710-0001) was used to capture and evaluate shipper reactions to the closure event at Lock 27. The purpose of this survey was to identify the total economic costs and the operational changes to industry associated with the closure event. Shippers were defined as companies that receive commodity traffic transiting Lock 27.

A total of 205 shipper surveys were sent out on 14 April 2006 to the same list of shippers who were surveyed following a 2004 lock closure. The mailing list was segmented into three groups based on the total number of tons shipped to determine which companies would receive the survey.

Group 1: >1,000,000 tons thru Lock 27 in 2003

Group 2: 100,000 – 1,000,000 tons thru Lock 27 in 2003

Group 3: 50,000 – 100,000 tons thru Lock 27 in 2003

The survey carried a suspense date of 12 May 2006. All surveys were conducted through the mail as funding and logistics prohibited actual on-site interviews. Completed forms were received from 44 companies, representing a response rate of 21 percent from the initial mailing.

A follow-up telephone campaign was conducted to obtain feedback from companies on the mailing list who had not yet responded. Of the 161 shippers contacted by telephone, four submitted a written response and 33 provided limited verbal responses during the telephone interview. These additional 37 replies increased the overall response rate to 40 percent.

b. Survey Responses. Overall, most of the shipping companies that responded indicated that the Lock 27 closures resulted in very little or no impact on company operations or costs. This was credited to ample advanced notification and the fact that that these closures occurred during what is typically a slow time of year for them. The auxiliary chamber remained in service during the closure of the main chamber, and it was noted by several companies that this option helped minimize any disruption. The survey questions and a summary of responses follow. Noted in parenthesis following each written comment is the type(s) of commodities handled at the companies that provided the survey response. This is intended to help correlate responses with products moving on the system that were potentially impacted by the closure.

Q1. Did your company have sufficient notice of the scheduled Lock 27 closures to prepare a response plan?

R1.

Table 3
Response Summary Shipper Survey Question 1

Response	Count	Percent
Yes	39	78
No	6	12
No Answer	5	10
Total	50	100

Five companies stated that they did not receive direct notification of the closure. Four companies stated that even though they received adequate notification, the closures occurred during a typically slow time of year. None of the companies that responded “No” provided an additional comment or explanation.

*Q2. During the period of closure of the **main lock chamber** at Lock 27 (Jan 3-Feb 25, 2006), what was your company’s response?*

R2. Table 4 includes the number of responses for each response category provided on the survey, and the types of commodities handled at the responding companies.

Table 4
Response Summary Shipper Survey Question 2

Number of Responses	Response Category	Types of Commodities Handled at Responding Companies
39 (written) 30 (verbal)	No change in procedures.	
4	Stockpiled product and waited for Lock 27 traffic to clear.	Chemicals; stone/stone products; barge unloading/warehouse; anti-freeze and car care products;
1	Switched to all-overland mode for product delivery from existing sources.	
1	Switched to different waterway routing for product delivery from existing sources.	Fertilizer
0	Switched product source to an entirely new source.	
0	Ceased operations during the period of closure.	
0	Altered production during the period of closure.	
0	Switched production to another facility.	
0	Purchased intermediate or final product, rather than produced.	
5	Other or combinations of the above.	Marine contractor; dry & liquid fertilizer, coal cement, DDG gypsum rock; petroleum products storage terminal (asphalt); industrial fuel oil; wholesale fertilizer & grain elevator
2	No answer.	

Other Comments:

- We receive only 4-6 barges per month – the delay was not a serious issue (trimellitic anhydride, purified isophthalic acid, maleic anhydride).
- Demobilized from Lake Michigan project during auxiliary lock closure (marine contractor).
- Because this is the slowest time of the year in the asphalt business we were affected very little (petroleum products/asphalt).
- Contracted more equipment to compensate for the delays (industrial fuel oil).
- We stockpile product for winter and don't expect barge traffic until late March (cement).
- Had no effect on us (stevedoring).
- Altered shipping schedules and transportation modes (fertilizer, grain).
- We unload our customer's products; we don't schedule the incoming materials.

- Suppliers shipped from locations that avoided Lock 27 (poultry feed).
- Almost all the barges we unload come from the south (barge unloading, fertilizer).
- If entire lock system at 27 was closed, then action would have changed (ag commodities/services).
- Lock 27 event resulted in no negatives affecting the operation (steel, flat rolled products).

Q3. Which of your commodities and tonnages were affected by this closure?

R3. 72% of those who responded to this question said that none of their commodities/ tonnages were affected by the closure. Table 5 presents the remainder of the responses for the commodities and/or tonnages reported as being impacted and the types of facility that responded.

Table 5
Response Summary Shipper Survey Question 3

Commodities Affected	Tonnages Affected	Type of Facility
Liquid caustic soda, methanol		Chemical distributor
PG 64-22 liquid asphalt		Storage facility
Cement	20,000 tons	Wholesale producer
Caustic soda (sodium hydroxide)		Bulk distributor/manufacturer
Metaxylene	4,000 metric tons/month	Chemical intermediate manufacturing
Psuedocumene	3,500 metric tons/month	
Anhydrous ammonia, urea ammonium nitrate		Terminal
Coal, bauxite		Barge terminal at quarry
Petroleum products		Oil company
Ethylene glycol		Material formulating & packaging plant
DDG's	1,500 tons	Corn wet miller
Coal, soybean meal, vitamins, vegetable oils, soybeans, corn, wheat		Ag commodities & services
All northbound fertilizer products		Grain elevator

Additional Comments:

- Our storage facility for asphalt products filled tanks before closure and was able to continue to serve customers. (asphalt products)
- Nitrogen terminal sent products to other terminal while lock was down. (anhydrous ammonia, urea ammonium nitrate)
- A specialty chemical dock reported that had the duration exceeded 3 weeks ortho-xylene and DEG would have been affected. (specialty chemicals)
- A bulk load/unload terminal reported that barges came in larger numbers at one time, instead of being more spread out. (bulk materials)

Q4. If a reasonable estimate can be made, what additional costs (over and above normal operations) did you incur as a result of the closure of the main chamber at Lock 27? If possible, please itemize according to the categories in question 2.

R4. For this question, 73% of the respondents incurred no additional costs and another 17% replied as N/A (not applicable), which may or may not mean no additional costs incurred. Other information provided regarding additional costs or impacts included:

- Negligible (additional costs)
- \$126,000 (additional costs)
- Higher than normal inventories
- Resulted in missed sales, added storage costs, and negative market factors
- \$216,000 (for one additional boat to move barges to lock)

Q5. Has the closure of the main chamber at Lock 27 caused your company to alter its long-term transportation strategy (e.g. switch to all-overland modes, increase stockpiles, etc.)? How will this impact your total commodity transportation or other costs (per year)? Please explain.

R5. Of the 44 responses for this question, 80% stated that no change in transportation strategy occurred as a result of the Lock 27 closure, and 11% replied N/A (not applicable) which may or may not indicate 'no change'. Additional comments offered include:

- Looked at stockpiling in anticipation of closure to a Lock closer to our location (Wilson Dam Lock). Costs would apply to market conditions. (poultry feed)
- Such a closure in the summer would require taking action and making other arrangements. (petroleum products storage-asphalt)
- Our commodity has no alternative means of transportation. (industrial fuel oil)
- The main chamber closure plus the hurricane will cause higher inventories of ethylene glycol. (anti-freeze, car care products)
- We have had to increasingly diversify our transportation strategies to keep our supply lines flowing, because of difficulties in waterway management. (wholesale fertilizer-grain elevator)

Q6. Has the closure of the main chamber at Lock 27 caused your company to take any other long-term permanent measures? (e.g., switch production to another facility, purchase intermediate or final product rather than produce, etc.)? Please explain. How will this affect your company's long-term operating costs (per year)?

R6. There were 43 responses to this question. 86% said there was no affect on long-term operating costs, 12% said N/A (not applicable) which, again, may or may not indicate 'no change'. One additional comment offered:

- Inability to take advantage of the river market due to unreliable waterway management (would affect long-term operating costs). (wholesale fertilizer-grain elevator)

Q7. Has your company been impacted by other navigation system disruptions? Did they influence your response to the main chamber closure at Lock 27?

R7. There were 40 responses to this question. 60% said their company was not impacted by other navigation system disruptions, and 5% said N/A. 35% indicated that their company had been impacted and offered the following responses to clarify their answer:

- Yes, the other closures did not have any influence. (chemical distributor)
- Closure of Wilson Dam Lock. (poultry feed)
- Yes, all closures need to be as well scheduled as Lock 27 was. Maintenance is the most important. (marine terminal/warehouse facility)
- We received absolutely no product Mar 20-Mar 25, 2006 when Wilson Main Lock was closed. We had to use trucks to bring in soybean meal. Currently stockpiling barges in preparation for Wilson Main Lock closure May 2-May 25, 2006. This will cost us quite a lot of demurrage. (feed mill)
- The closing of Loudon, Watts Bar and Chickamauga Locks creates a problem for us. No-they did not influence our response to the main chamber Lock 27 closure. (liquid asphalt storage/shipment)
- (Impacted by) low water when the Missouri River shuts down in October/November. (fertilizer)
- Yes (been impacted by other disruptions). No (didn't influence response to Lock 27 main chamber closure). (cement)
- Probably, but we only deal with Peru, IL facility. (fertilizer)
- We are affected anytime river transportation on the Upper Mississippi and Illinois Rivers takes place in the summer. (petroleum products storage-asphalt)
- Yes (have been impacted). No (did not influence response). (stone/stone products)
- Yes, the Ohio River closure in Jan-Feb 2005 (impacted us). No, it did not influence our response (to Lock 27 closure). (industrial fuel oil)
- Other disruptions – Jan 19, 2005 barge explosion from Lemont to North Chicago. Incurred additional \$11,900 in restricted tows and river wasn't back to normal for a six-month period. (salt)
- Hurricane Katrina affected the entire river system. It is difficult to pinpoint the exact time delay. (ag commodities/services)
- Disruptions in the New Orleans area (recent) have had a dramatic influence to our product – inbound/outbound-placement and transportation costs. (wholesale fertilizer-grain elevator)

*Q8. Please describe if/how the temporary closure of the **auxiliary chamber** at Lock 27 (from Oct 17-Dec 22, 2005) impacted your company.*

R8. Of the 39 response to this question, 46% said they were not impacted and 26% replied N/A (not applicable). The remaining 28% listed the following impacts related to the closing of the auxiliary chamber:

- We had to stockpile inventory of material. (chemical distributor)
- Slowed trip times. (wholesale cement producer)
- Just had to manage supplies. (fertilizer)

- This was at the end of our busy season and delays in shipments caused us to run out of product. (petroleum products storage)
- Rearranged unloading schedule. (stone/stone products)
- Moderate impact – delays on equipment. (industrial fuel oil)
- Increased transportation costs and if we would have not been able to increase our storage, it would have cost us \$1,000,000. With the ability to increase our storage we made \$1,000,000 more profit. (corn, beans, fertilizer, coal, cottonseed, UAN)
- To return barges down river empty and release them from demurrage. (cement)
- Affected fleet size of tows. (salt)
- A barge of DDG's (1500 tons) was delayed. (corn wet miller, ethyl alcohol, corn starch, maltodextrin, DDGs, corn gluten meal)
- This slowed the inbound barges during a critical fall fertilizer season. (wholesale fertilizer-grain elevator)

Q9. The two lock closures were scheduled approximately 1 month apart. Did this present any unusual or difficult situations for your company?

R9. 77% of the 43 responses to this question reported that closing of the auxiliary lock did not present and unusual or difficult situations for their company. 9% replied N/A, and the remaining 14% offered the following comments:

- Two months apart in the summer would be a big problems for us. (petroleum products storage-asphalt)
- Any lock closure and downtime presents a difficult situation. (industrial fuel oil)
- With adequate notice we can manage our product inventories. (petroleum refining)
- From 3/1 to 12/15 is a bad time for us. (corn, beans, fertilizer, coal, cottonseed, UAN)
- Just the October closure. (cement)
- Longer delivery times. (anti-freeze , car care products)
- Shipping schedules. (wholesale distributor of fertilizer)

Q10. Other Comments.

R10. The majority of the written comments provided in response to this question reiterate that with sufficient notification most companies are able to survive short-term lock closures with no or minimal impacts to business.

- If these closures had occurred between May and early October when we do tow stone from UMR L27 to Lake Michigan, additional costs incurred. (marine contractor)
- The materials we ship north are seasonal so the timing of the closures did not affect us. (barge unloading/loading)
- Keep up the good work! (marine terminal/warehouse facility)
- If the one week closure of Wilson in March is a true indicator, I am concerned about Kentucky Lock closure and the two Wilson Lock closures scheduled. These Locks cannot be avoided by our suppliers. We use about 350,000 bushels of corn

per week. Too much to bring in by truck. The only solution is to stockpile and pay demurrage. (feed mill)

- Shipment of the product we handle is controlled by ConocoPhillips Corp, Wood River, IL. (liquid asphalt storage/shipment)
- We appreciate receiving early notifications. (trimellitic anhydride, purified isophthalic acid, maleic anhydride)
- Like everyone, we cringe when the locks close. (industrial fuel oil)
- Gary (Indiana) Works was not affected by the Lock 27 closure. (integrated steel plant-flat rolled products)
- Your website to check river gauges is too slow and is difficult to log into most of the time. (grain terminal-corn, soybeans)
- I don't know to what extent aux chamber caused traffic to slow. If it had significant impact then #8 (made \$1 million more profit) is true. If no impact then #8 is not true. (corn, beans, fertilizer, coal, cottonseed, UAN)
- In this situation, a lock was open. Had both locks been closed at the same time, the estimated logistic change would have cost in the million+ per month range. (ag commodities/services)
- Due to our customers scheduling our inbound materials, we did not experience any additional costs. (barge terminal-bulk products)

These additional comments were provided during the follow-up telephone interviews.

- No operation through the lock at that time.
- Had very good notice above St. Louis.
- Operate on the Tennessee River with only about 6 barges to Red Wing, MN per year– generally don't hear about Mississippi River closures.
- March-May are heavy traffic months, price affected by market; we get good notice and just work around it.
- We are a Port Authority/stevedoring outfit and just arrange for transportation or load/unload barges.
- Our customers shipping north-bound products had them in place at that time.

5. CARRIER SURVEY

a. Survey Procedures. The OMB-approved Carrier Survey (Control #0710-0001) was a more targeted survey conducted of the major towing companies that normally use Lock 27. The purpose of this survey was to identify carrier reactions to the closure of the main chamber at Lock 27.

A total of 23 carrier surveys were sent out to the same list of operators who received the 2005 survey. Completed survey forms were received from 10 companies, representing a response rate of 43 percent. Through the follow-up telephone campaign, all of the carriers who had not yet responded were contacted and one additional written response was received, increasing the response rate for this group to 48 percent.

b. Survey Responses. The actual survey questions and responses are provided below. Noted in parenthesis following each written comment is the type(s) of commodities handled by the company that provided the survey response. This is intended to help correlate responses with products moving on the system that were potentially impacted by the closure.

Q1. Did your company have sufficient notice of the scheduled Lock 27 closures to prepare a response plan?

R1.

Table 6
Summary Response Carrier Survey Question 1

Response	Count	Percent
Yes	11	100
No	0	0
No Answer	0	0
Total	11	100

Comments:

- We normally run south of St. Louis. (rock)
- At the time of these closures in the season, KIM felt little impact. (liquid chemicals, refined products)
- Never a good time to close a major lock, but work must be done. (lubes, chemicals, coal, petcoke)
- The main chamber closure was well scheduled. The auxiliary chamber presented problems during the heart of grain season. (grain, fertilizer, steel, coal, coke, aggregates, chemicals)

*Q2. How did your company operate during the scheduled **main chamber** outage at Lock 27 (Jan 3-Feb 25, 2006)?*

R2. Table 7 shows the total number of responses received for each response category provided in the survey for this question. Multiple responses were accepted.

Table 7
Response Summary Carrier Survey Question 2

Number of Responses	Response Category	Types of Commodities Handled at Responding Companies
0	Barges were tied up at fleeting areas; towboats operated elsewhere in the system.	
7	Towboats remained in queue with barges	Fleeting; general barge line; all commodities except hazardous liquids; coal; petroleum; grain, fert, steel, coal, coke, cement, aggregates, chemicals; all bulk commodities except liquids
0	Towboats (light) held positions in queue.	
3	Tows were dispatched ready-to-lock at Lock 27.	Fleeting; lubes, chemicals, coal, petcoke; grain, fert, steel, coal, coke, cement, aggregates, chemicals
5	Tows were broken to lock through the auxiliary lock.	General barge line; all commodities except hazardous liquids; lubes, chemicals, coal, coke, petcoke; grain, fert, steel, coal, coke, cement, aggregates, chemicals; all bulk commodities except liquids
5	Towboats (light) participated in industry self-help.	General barge line; barge cleaning/repair; all commodities except hazardous liquids; lubes, chemicals, coal, petcoke; all bulk commodities except liquids
3	Towboats tied off barges and participated in industry self-help.	Barge cleaning/repair; grain, fert, steel, coal, coke, cement, aggregates, chemicals; all bulk commodities except liquids
1	Company avoided the lock when possible.	Barge cleaning/repair
	No answer.	
2	Other (please explain)-see below	

Other (please explain):

- We were able to work with other companies and lock thru with others. (barge cleaning/repair)
- Minor delays. (liquid chemicals & refined products)

Comments:

- Would participate in industry self-help if called upon. (all commodities except hazardous liquids)
- When a 1200' lock is taken out of service and the traffic level exceeds the capacity of a 600' lock, repairs should be expedited on an emergency basis. Such repairs should include detailed preplanning and pre-positioning of equipment. Districts should ask for assistance in both manpower and equipment and technical assistance. (general barge line)
- Timing of the main chamber closure was such that it did not materially affect normal operations. (grain, fertilizer, steel, coal, coke, cement, aggregates, chemicals)

Q3. If a reasonable estimate can be made, what additional costs (over and above normal operations) did you incur as a result of the main chamber closure at Lock 27?

R3. Table 8 lists the information provided on additional costs incurred as a result of the closure event.

Table 8
Response Summary Carrier Survey Question 3

Impact	Additional Costs Incurred	Types of Commodities Handled at Responding Companies
Assist boat	\$900 for 1.5 hr	Fleeting & switching
Delays of boat & barges	\$400/delay hour/tow	General barge line
Additional crew pay for stand-by time		Barge cleaning/repair
Additional costs for waiting in lock queue (doesn't count lost revenue from barge customers)	\$300/hour	All commodities except hazardous liquids
Delay cost for waiting lock turn	\$268/hour	Coal
Additional locking time & waiting time, plus lock assist costs	6 hr avg for 8 wks @ \$300/hr = \$57,600 x 2 (both directions) = \$115,200	Grain, fertilizer, steel, coal, coke, cement, aggregates, chemicals
Lock delay, lost boat productivity, lost barge productivity	\$380 hrs of lock delay; \$220,725 boat; \$66,000 barge	All bulk commodities except liquids

Q4. Prior to the closure at Lock 27, towing industry representatives, in cooperation with the Corps of Engineers, developed some operation procedures that were put in place at the time of the closure. Do you believe this effort was (a) effective, (b) ineffective, or (c) only partially effective? (Please explain)

R4. There were 11 responses given to this question; 82% said the operation procedures were effective, and 18% said they were partially effective. The ratings, additional comments provided, and the types of commodities handled by the responding companies are provided in Table 9.

Table 9
Response Summary Carrier Survey Question 4

Rating	Additional comments	Types of Commodities Handled at Responding Companies
Effective		Fleeting & switching
Effective		General barge line
Effective	Industry self-help assisted plan	Rock
Effective	Had to use the lock to and from Granite; experienced good communication and cooperation.	Barge cleaning/repair
Effective	Moved vessels through the locks faster	All commodities except hazardous liquids
Effective		Liquid chemicals, refined products
Partially effective		Coal
Effective		Petroleum
Effective		Lubes, chemicals, coal, petcoke
Partially effective	No plan double lock can be as effective as single locking a complete tow.	Grain, fertilizer, steel, coach, coked, cement, aggregates, chemicals
Effective	Self-help program and provided tug service helped lower losses in boat and barge productivity.	All bulk commodities except liquids

Q5. Did the experience with the main chamber closure at Lock 27 cause your company to adopt any new operating procedures to accommodate lock outages elsewhere in the system?

R5. Of the 11 responses received for this question, 91% said “No” their company did not adopt any new operating procedure; one company replied N/A (not applicable). Two additional comments stated:

- Our towing pattern mandates we transit between Gulf coast and Chicagoland. (lubes, chemicals, coal, petcoke)
- Each outage has to be treated differently due to traffic patterns, time of the year and volumes at the lock. (grain, fertilizer, steel, coal, coke, cement, aggregates, chemicals)

*Q6. Please describe if/how the temporary closure of the **auxiliary lock** (from Oct 17-Dec 22, 2005) impacted your company.*

R6. 36% of respondents said there were no impacts to their company. Stated impacts include:

- We were forced to crew additional boats to keep up with the demand and to have a boat on both ends of the Lock with tows. (fleeting and switching)
- Only impact was delay. (general barge line)
- No impact as we usually go south of St. Louis. (rock)
- It cost additional downtime for barges and boat. (coal)
- Increased transit times; bunching of tows/barges. (lubes, chemicals, coal, petcoke)
- Eliminated the relief for small tows locking in the small chamber and added delay at the large chamber during the busiest time of the year. (grain, fertilizer, steel, coal, coke, cement, aggregates, chemicals)
- 80 hours of additional lock delay. (all bulk commodities except liquids)

Q7. The 2 lock closures were scheduled approximately 1 month apart. Did this present any unusual or difficult situations for your company?

R7. 82% of the responses to this question said “No” unusual or difficult situations were created for their company when the two lock closures were scheduled one month apart. Three additional comments were offered:

- Had there been ice this winter the impact would have been far greater in delay time and thus economic impact.
- Caused increased transit times.
- The auxiliary outage during grain season was the most disruptive and contributed to a very tight barge supply.

6. OMNI DATA ANALYSIS

a. Introduction. This analysis uses the U.S. Army Corps of Engineers Operation & Maintenance of Navigation Installations data, OMNI, to investigate whether shippers and carriers who transited Lock 27 during the scheduled October-December 2005 auxiliary chamber closure and the January-February 2006 main chamber closure, reacted by modifying operating procedures.

b. Chronology of Notices to Navigation Interests. The St. Louis District published two Navigation Notices with regard to the 2005 auxiliary chamber closure and the 2006 main chamber closure at Lock 27. These notices provide the navigation industry with situational awareness and can be used to help shippers and carriers prepare for disruptive maintenance closures.

On 24 August 2005, the St. Louis District issued a Navigation Notice announcing the closure of Lock 27 auxiliary chamber from 1 October – 27 November 2005 and the closure of the main chamber from 3 January – 1 March 2006. The expected duration of the closures was 61 days and 60 days, respectively.

On 19 September 2005, the St. Louis District issued a revision to the closure dates for the auxiliary lock only. The new schedule called for closing the lock on 17 October and reopening on 13 December; an expected duration of 57 days.

OMNI data indicates that the auxiliary chamber actually closed on 17 October 2005 and reopened on 22 December; an actual duration of 67 days. The main chamber actually closed on 3 January 2006 and reopened on 25 February; an actual duration of 54 days.

c. Delays. For the period of closure of the auxiliary lock chamber (10/17/05 – 12/22/05) as shown on Figure 1, average delay was recorded as 1.9 hours/tow. This included a week in December where the average delay spiked to 9.5 hours/tow. See Figure 2, previous year average delay for this period (10/17/04 – 12/22/04) was only .6 hours/tow. For the period of closure of the main chamber (01/03/06 – 02/25/06) shown on Figure 1, average delay was recorded as 6.9 hours/tow. This included a single day in February where delay spiked to 22hours/tow.

Figure 1 - Locks 27
Average Daily Tow Delays
September 2005 - March 2006

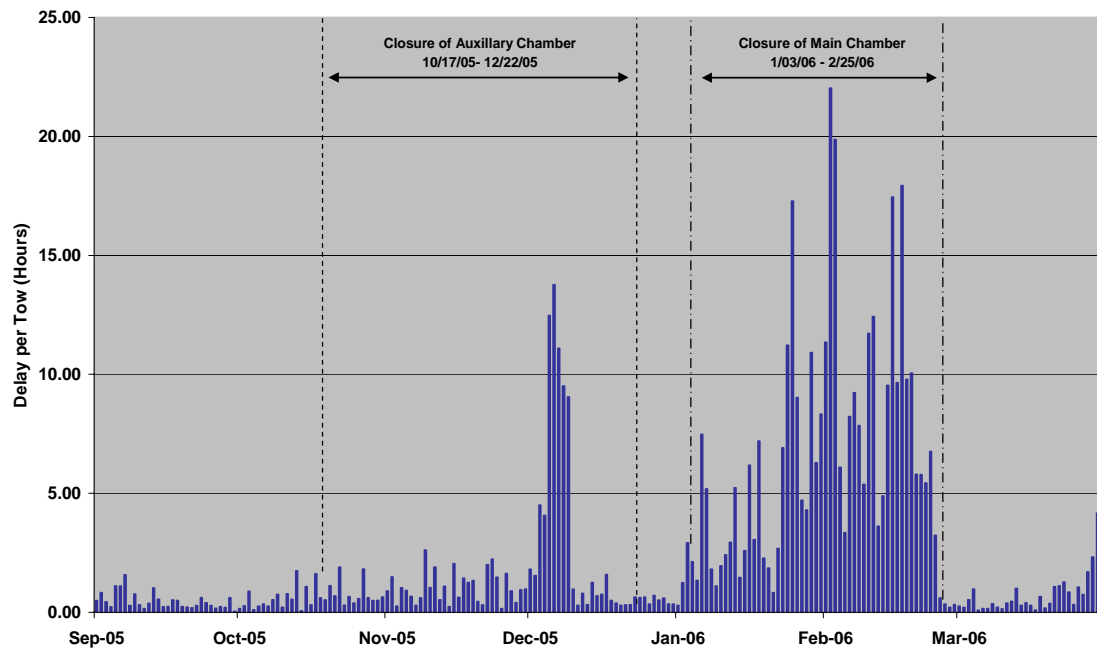
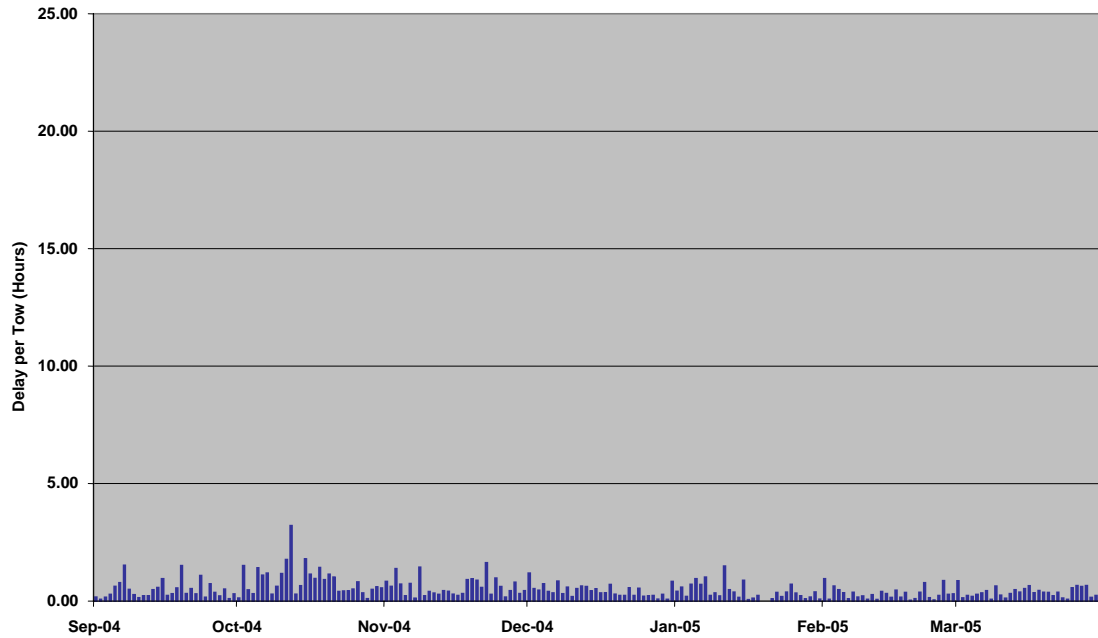


Figure 2 - Locks 27
Average Daily Tow Delays
September 2004 - March 2005



d. Tow Size (Barges per Tow). No significant change in tow size was shown in OMNI data as a result of these closures. For the period of closure of the auxiliary lock chamber (10/17/05 – 12/22/05) as shown on Figure 3, average tow size was recorded in the OMNI system as 8.7 barges per tow. See Figure 4, previous year average tow size for this period (10/17/04 – 12/22/04) was 9.3 barges/tow. For the period of closure of the main chamber (01/03/06 – 02/25/06) shown on Figure 3, average tow size was recorded as 7.6 barges/tow, as compared to 7.8 barges/tow recorded for the same period one year earlier (01/17/05 – 02/25/05).

OMNI data presented in Table 10, shows slightly greater percent empty barges during both the closure periods as compared to the same period in the previous year. Table 11 shows tons/tow increasing for the auxiliary lock closure, but decreasing for the main lock closure as compared to the same period in the previous year.

Table 10 - Loaded and Empty Barges at Lock(s) 27 (Both Chambers Combined)

	<u>Auxiliary Lock Closure</u> <u>10/17/05 – 12/22/05</u>	<u>Previous Year</u> <u>10/17/04 – 12/22/04</u>
Barges	10869	12892
Loaded	7515 (69%)	9197 (71%)
Empty	3353 (31%)	3695 (29%)
	<u>Main Lock Closure</u> <u>01/03/06 – 02/25/06</u>	<u>Previous Year</u> <u>01/03/05 – 02/25/05</u>
Barges	6164	5967
Loaded	4214 (69%)	4344 (73%)
Empty	1932 (32%)	1623 (27%)

Table 11 – Tons, Tows, and Tons/Tow at Lock(s) 27 (Both Chambers Combined)

	<u>Auxiliary Lock Closure</u> <u>10/17/05 – 12/22/05</u>	<u>Previous Year</u> <u>10/17/04 – 12/22/04</u>
Tons	12,228,909	14,804,162
Tows	1188	1591
Tons/Tow	10294	9305
	<u>Main Lock Closure</u> <u>01/03/06 – 02/25/06</u>	<u>Previous Year</u> <u>01/03/05 – 02/25/05</u>
Tons	7,090,386	7,086,246
Tows	776	762
Tons/Tow	9137	9300

Figure 3 - Locks 27
Barges per Tow
September 2005 - March 2006

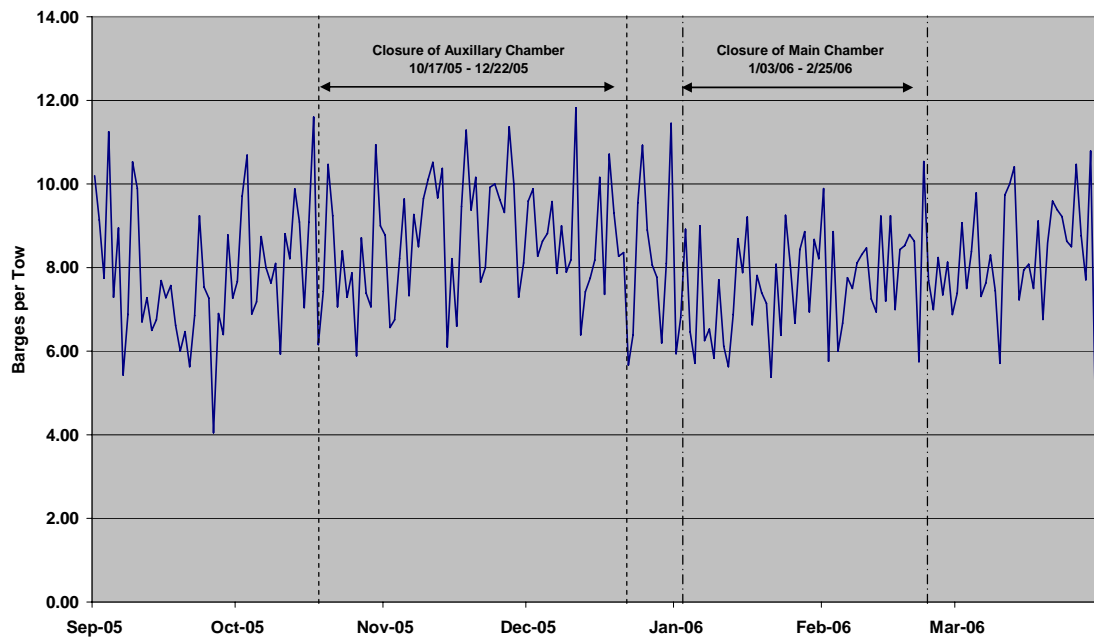
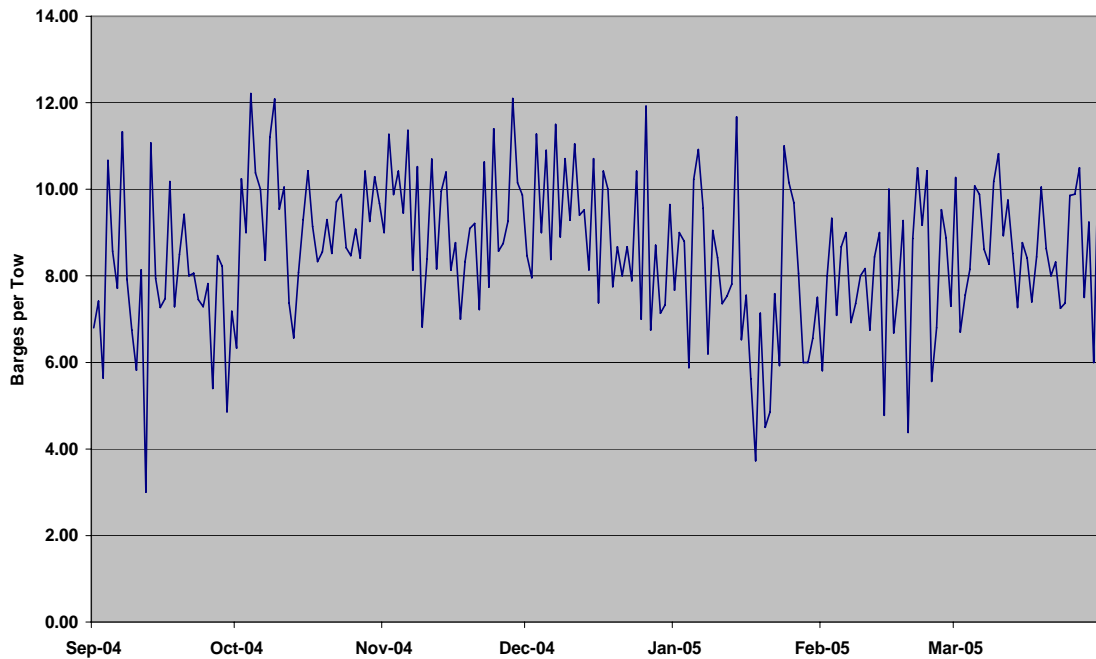
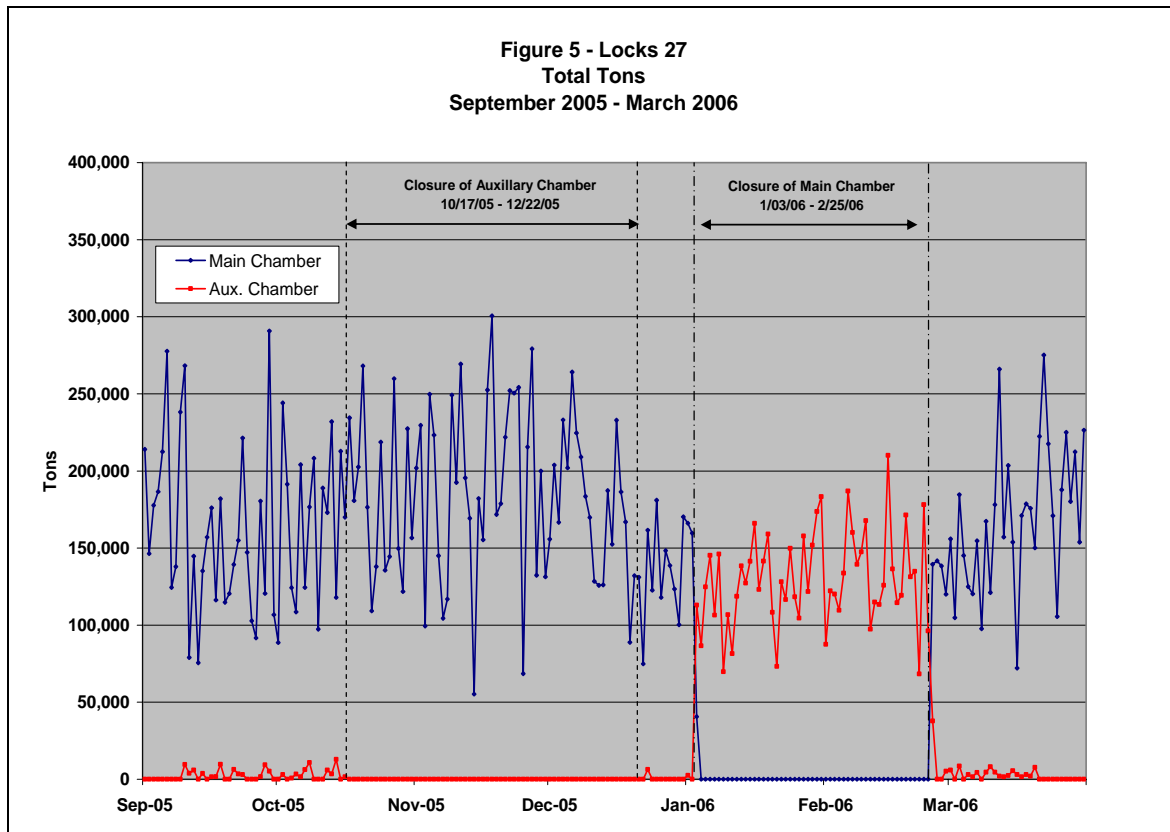
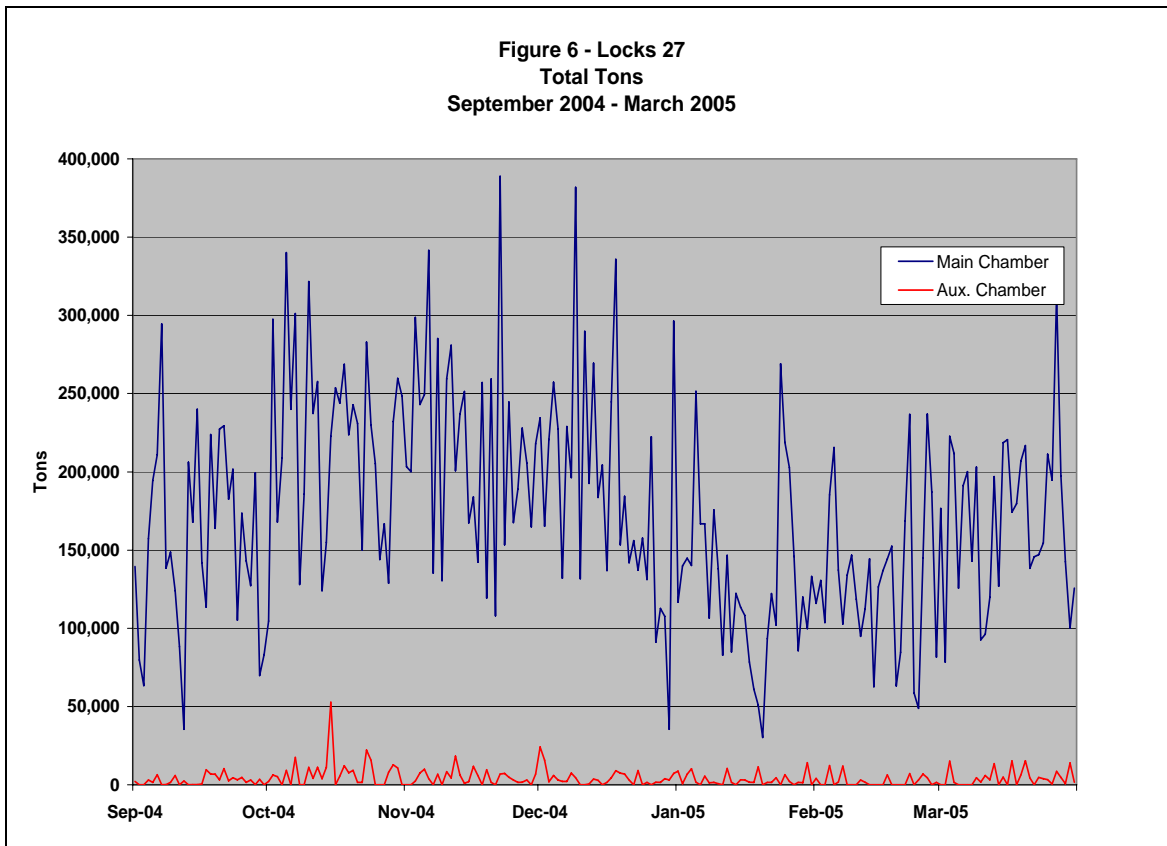


Figure 4 - Locks 27
Barges per Tow
September 2004 - March 2005



e. Total Tons. As recorded in the OMNI system for the period of closure of the auxiliary lock chamber (10/17/05 – 12/22/05), 12.2 million tons of various commodities passed thru the Lock 27 main chamber. See Figure 6, previous year tonnage locking thru Lock 27 for this period (10/17/04 – 12/22/04) was 14.4 million tons in the main chamber and .4 million tons in the auxiliary chamber for a total of 14.8 million tons. For the period of closure of the main chamber (01/03/06 – 02/25/06), 6.9 million tons of various commodities passed thru the auxiliary chamber. Previous year tonnage passing thru Lock 27 for the period 01/03/05 – 02/25/05 was 6.9 million tons in the main chamber and .2 million tons in the auxiliary for a total of 7.1 million tons. Even with the main chamber closed, there wasn't a significant change in tonnage locked thru Lock 27 from the previous year. This can be attributed to the winter months of January and February being typically light traffic months.





f. Arrivals of Commercial Tows. As recorded in the OMNI system for the period of closure of the auxiliary lock chamber (10/17/05 – 12/22/05), 1248 tows, an average of 18.6 per day, arrived at Locks 27. See Figure 8, previous year arrivals at Lock 27 for this period (10/17/04 – 12/22/04) were 1430 tows, an average of 21.3 tows/day. For the period of closure of the main chamber (01/03/06 – 02/25/06), 809 tows, an average of 15 tows per day, arrived at Locks 27. Previous year arrivals at Locks 27 for the period 01/03/05 – 02/25/05 were 767 tows, an average of 14.2 tows per day. Even with the main chamber closed, there wasn't a significant change in arrivals at Locks 27 from the previous year. This can be attributed to the winter months of January and February being typically light traffic months.

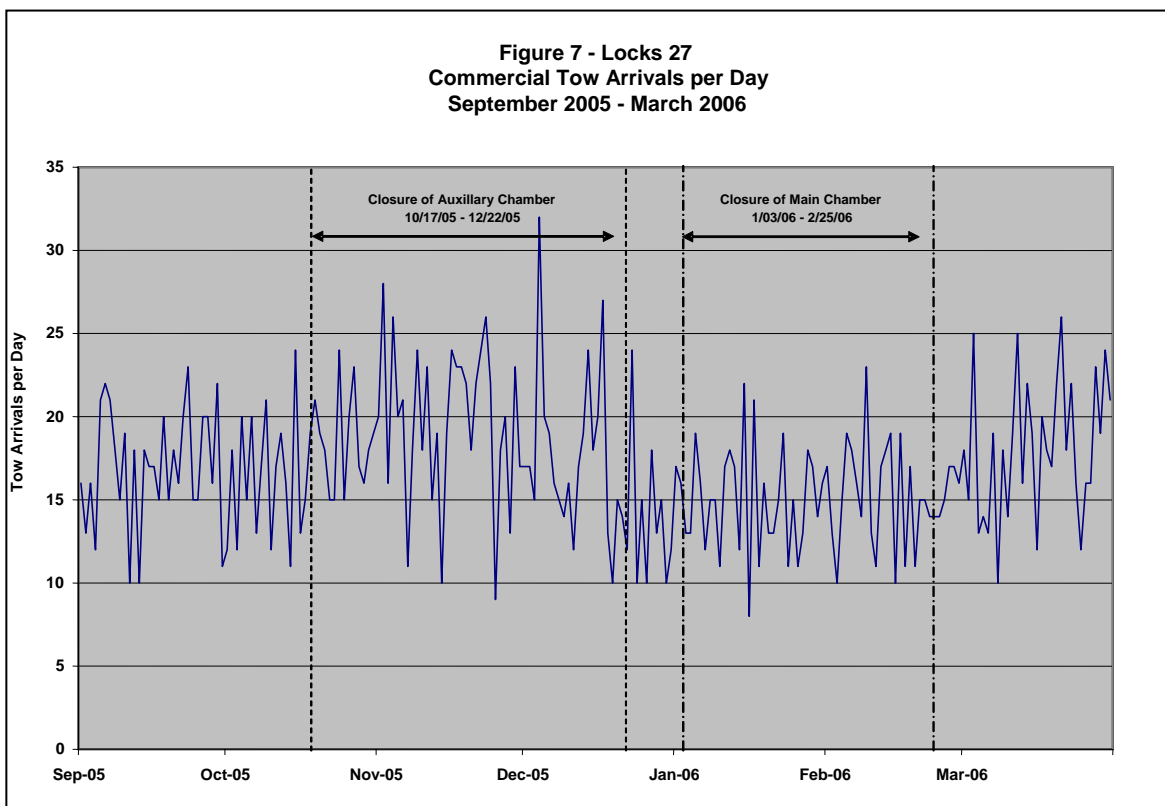
Prior to closure of the auxiliary lock chamber during the period 09/01/05 – 10/16/05 there were a total of 769 tow arrivals, or 16.7 arrivals per day. Previous year arrivals at Locks 27 during the period 09/01/04 – 10/16/04 totaled 812, or 17.7 tow arrivals per day. Arrival of tows during the closure periods (and for the same period one year earlier) are shown on tables 12 and 13.

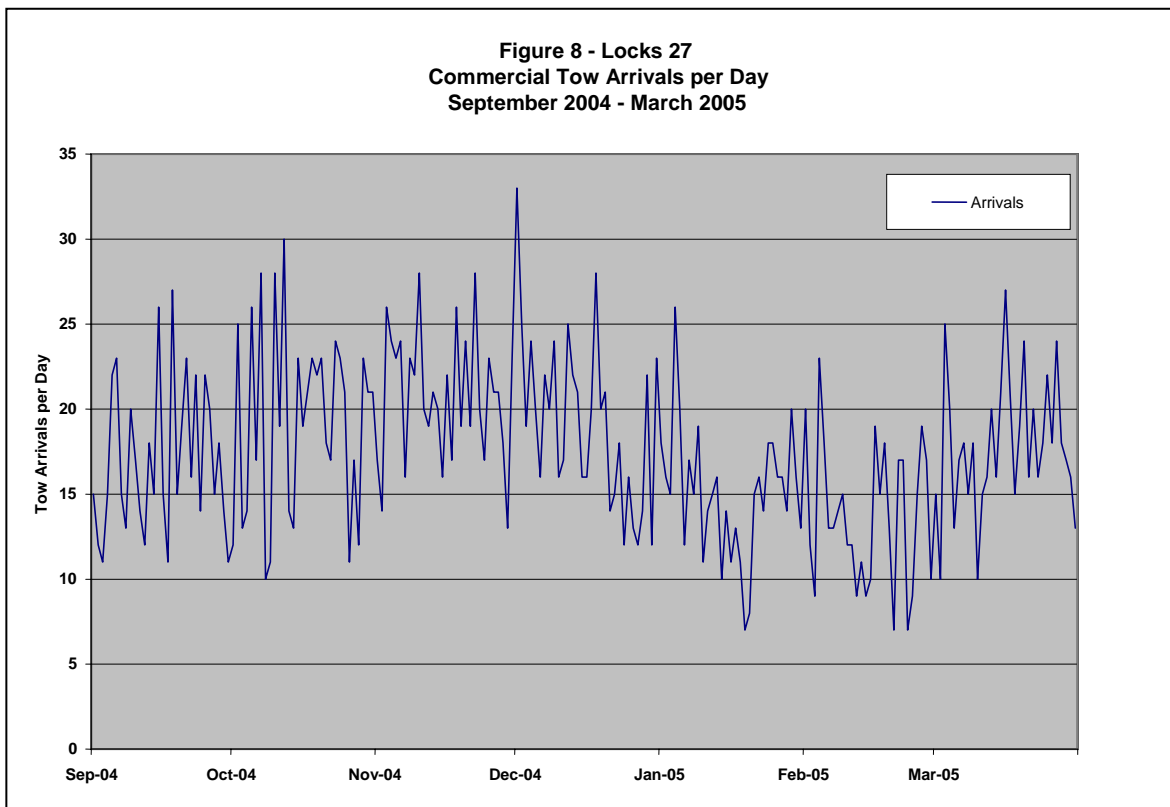
Table 12 - Commercial Tow Arrivals (2005 -2006)

	Period Prior to Closures <u>09/01/05 – 10/16/05</u>	Auxiliary Lock Closure <u>10/17/05 – 12/22/05</u>	Main Lock Closure <u>01/03/06 – 02/25/06</u>
Total Arrivals	769	1248	809
Ave. Arrivals/day	16.7	18.6	15

Table 13 - Commercial Tow Arrivals (2004 -2005)

	Period Prior to Closures <u>09/01/04 – 10/16/04</u>	Auxiliary Lock Closure <u>10/17/04 – 12/22/04</u>	Main Lock Closure <u>01/03/05 – 02/25/05</u>
Total Arrivals	812	1430	767
Ave. Arrivals/day	17.7	21.3	14.2





g. Daily OMNI Data displayed for 2004, 2005, and 2006 Closure Periods At Upper Mississippi River Locks 27. Daily delay data from OMNI is shown in tables 14, 15 and 16 for the closure periods and periods prior to and following the closures. As expected, impact is significant with a main lock closure. A smaller impact results from the auxiliary lock closure. Seasonality of traffic on the Upper Mississippi River also plays a part in impacts of these closures.

**TABLE 14 - OMNI DATA
LOCK 27 MAIN CHAMBER CLOSURE
26 JULY - 10 AUGUST 2004**

DATE	TOWS	TOTAL BARGES	TOTAL DELAY MINUTES
MI27 All Chambers			
20040715	25	230	1,034
20040716	21	209	581
20040717	17	178	531
20040718	22	169	837
20040719	17	161	336
20040720	30	275	1,054
20040721	22	201	520
20040722	26	201	758
20040723	21	186	418
20040724	19	208	533
20040725	12	93	246
20040726	14	121	3,199
20040727	15	157	12,645
20040728	15	154	22,685
20040729	15	144	23,516
20040730	16	163	32,713
20040731	16	178	39,440
20040801	21	170	56,534
20040802	10	133	36,566
20040803	18	146	55,340
20040804	15	154	54,477
20040805	16	187	49,002
20040806	19	148	81,329
20040807	17	175	41,121
20040808	15	175	70,552
20040809	17	194	57,769
20040810	12	119	43,114
20040811	24	254	106,214
20040812	41	383	90,701
20040813	37	402	28,918
20040814	19	229	777
20040815	14	132	214
20040816	15	108	265
20040817	13	105	250
20040818	22	200	1,285
20040819	22	208	709
20040820	20	146	556
20040821	13	128	307
20040822	18	175	707
20040823	22	207	512
20040824	16	105	211

**TABLE 15 - OMNI DATA
LOCK 27 AUXILLIARY CHAMBER CLOSURE
17 OCTOBER - 22 DECEMBER 2005**

DATE	TOWS	TOTAL BARGES	TOTAL DELAY MINUTES		DATE	TOWS	TOTAL BARGES	TOTAL DELAY MINUTES
MI27 All Chambers					MI27 All Chambers			
20051007	14	112	219		20051119	21	197	1,671
20051008	16	122	509		20051120	19	193	509
20051009	20	162	906		20051121	20	153	368
20051010	14	83	174		20051122	25	200	3,001
20051011	16	141	746		20051123	25	248	3,350
20051012	19	156	627		20051124	23	236	2,110
20051013	17	168	1,780		20051125	8	77	78
20051014	11	100	40		20051126	19	177	1,858
20051015	24	169	1,551		20051127	19	216	1,027
20051016	13	118	239		20051128	14	140	341
20051017	15	174	1,451		20051129	21	153	1,187
20051018	19	117	693		20051130	19	154	1,113
20051019	21	156	649		20051201	17	163	1,846
20051020	19	199	1,282		20051202	17	168	1,568
20051021	17	157	704		20051203	15	124	4,060
20051022	16	113	1,823		20051204	19	164	4,635
20051023	15	126	271		20051205	22	194	16,458
20051024	24	175	946		20051206	19	182	15,687
20051025	15	118	347		20051207	21	165	13,989
20051026	18	106	614		20051208	17	153	9,698
20051027	24	209	2,626		20051209	18	142	9,779
20051028	18	133	674		20051210	16	131	934
20051029	16	113	470		20051211	11	130	191
20051030	17	186	634		20051212	18	115	854
20051031	18	162	686		20051213	19	141	368
20051101	22	193	1,189		20051214	24	186	1,799
20051102	28	184	2,504		20051215	17	139	714
20051103	16	108	249		20051216	19	193	870
20051104	24	197	1,480		20051217	28	206	2,667
20051105	22	212	1,211		20051218	14	150	416
20051106	21	154	850		20051219	10	93	231
20051107	11	102	190		20051220	15	124	261
20051108	18	153	655		20051221	14	117	264
20051109	23	222	3,609		20051222	12	68	229
20051110	18	182	1,121		20051223	23	147	885
20051111	21	221	2,400		20051224	11	105	411
20051112	18	174	573		20051225	15	164	573
20051113	19	197	1,244		20051226	10	89	203
20051114	10	61	145		20051227	18	145	769
20051115	19	156	2,338		20051228	13	101	397
20051116	20	132	758		20051229	15	93	530
20051117	26	246	2,245		20051230	10	81	208
20051118	24	271	1,797		20051231	11	126	225

**TABLE 16 - OMNI DATA
LOCK 27 MAIN CHAMBER CLOSURE
03 JANUARY - 25 FEBRUARY 2006**

DATE	TOWS	TOTAL BARGES	TOTAL DELAY MINUTES		DATE	TOWS	TOTAL BARGES	TOTAL DELAY MINUTES
MI27 All Chambers					MI27 All Chambers			
20060101	18	107	310		20060202	17	98	22,474
20060102	16	109	1,186		20060203	14	124	16,690
20060103	13	116	2,281		20060204	18	108	6,585
20060104	13	84	1,660		20060205	15	100	3,003
20060105	17	97	1,364		20060206	17	132	8,382
20060106	14	126	6,283		20060207	18	135	9,963
20060107	16	100	4,982		20060208	18	146	8,480
20060108	15	98	1,632		20060209	16	133	5,151
20060109	12	70	795		20060210	15	127	10,546
20060110	14	108	1,641		20060211	16	116	11,937
20060111	17	104	2,467		20060212	16	111	3,478
20060112	16	90	2,826		20060213	13	120	3,814
20060113	17	117	5,333		20060214	15	108	8,584
20060114	13	113	1,142		20060215	17	157	17,804
20060115	16	126	2,490		20060216	15	105	8,683
20060116	14	129	5,193		20060217	14	118	15,057
20060117	16	106	2,928		20060218	15	128	8,815
20060118	16	125	6,910		20060219	14	123	8,450
20060119	15	111	2,056		20060220	16	138	5,569
20060120	14	100	1,562		20060221	16	92	5,562
20060121	13	70	648		20060222	13	137	4,235
20060122	12	97	1,928		20060223	16	123	6,493
20060123	13	83	5,400		20060224	14	98	2,718
20060124	12	111	8,081		20060225	17	140	617
20060125	16	129	16,590		20060226	17	125	343
20060126	18	120	9,737		20060227	16	130	199
20060127	14	118	3,956		20060228	17	117	333
20060128	14	124	3,612		20060301	18	133	281
20060129	16	111	10,478		20060302	15	136	182
20060130	15	130	5,651		20060303	21	162	697
20060131	14	115	6,995		20060304	16	134	940
20060201	9	89	6,127		20060305	14	137	75

APPENDIX A

NOTICE TO NAVIGATION INTERESTS



US ARMY CORPS
OF ENGINEERS
ST. LOUIS
DISTRICT

Navigation Notice

River:
UPPER MISSISSIPPI RIVER

Date:
24 Aug 2005

Notice No:
PN 05-04

Effective Period:
10/01/2005 -03/01/2006

In Reply Refer to:
CEMVS-00-N

SPECIAL NOTICE TO NAVIGATION INTERESTS

Locks No. 27, Upper Mississippi River Mile 185.1

1. All navigation interests are advised that the St. Louis District will be sequentially closing both lock chambers at Locks No. 27 for Lift Gate Machinery and Counterweight Rehabilitation, construction contract with Midwest Foundation Corporation.
2. The first closure will be the auxiliary lock chamber from 0600 hours on 1 October 2005 until 0600 hours 27 November 2005. During the times that the auxiliary lock chamber is closed, the main lock chamber will remain open.
3. The second closure will be the main lock chamber from 0600 hours 3 January 2006 until 0600 hours 1 March 2006. During the times that the main lock chamber is closed, the auxiliary lock chamber will remain open. However, since the auxiliary lock is not equipped with tow haulage equipment, double lockage tows will have to arrange for pull boat assistance. The towing industry self help program of using waiting tow-boats to assist in pulling cuts will be coordinated when the situation warrants.
4. All navigation interest should be alert for, and abide by, any special instructions that may be issued by the Lockmaster in conjunction with these closures.

FOR THE DISTRICT ENGINEER:

Andrew C. Schimpf
Rivers Project Manager



US ARMY CORPS
OF ENGINEERS
ST. LOUIS
DISTRICT

Navigation Notice

River:
LOWER MISSISSIPPI RIVER

Date:
19 Sep 2005

Notice No:
PN 05-08

Effective Period:
10/17/2005 - 03/01/2006

In Reply Refer to:
CEMVS-CO-N

SPECIAL NOTICE TO NAVIGATION INTERESTS

Locks No. 27, Lower Mississippi River Mile 185.1

1. All navigation interests are advised that the St. Louis District is revising the closure schedule for the Auxiliary Lock Chamber at Locks 27, due to a slippage in delivery of lift gate machinery.
2. The new closure dates for the auxiliary lock chamber are from 0600 hours on 17 October 2005 until 0600 hours 13 December 2005. During the times that the auxiliary lock chamber is closed, the main lock chamber will remain open.
3. The second closure, of the main lock chamber, remains unchanged and will be from 0600 hours 3 January 2006 until 0600 hours 1 March 2006. As noted in the previous Navigation Notice dated 24 August 2005, during the times that the main lock chamber is closed, the auxiliary lock chamber will remain open. However, since the auxiliary lock is not equipped with tow haulage equipment, double lockage tows will have to arrange for pull boat assistance. The towing industry self help program of using waiting tow boats to assist in pulling outa will be coordinated when the situation warrants.
4. All navigation interest should be alert for, and abide by, any special instructions that may be issued by the Lockmaster in conjunction with these closures.

FOR THE DISTRICT ENGINEER:

Andrew C. Schimpf
Rivers Project Manager

APPENDIX B

SHIPPER AND CARRIER SURVEY FORMS

AND

COVER LETTERS



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
ROCK ISLAND DISTRICT, CORPS OF ENGINEERS
CLOCK TOWER BUILDING - P.O. BOX 2004
ROCK ISLAND, ILLINOIS 61204-2004

<http://www.mvr.usace.army.mil>

February 25, 2005

Executive Office

Dear _____

The Corps of Engineers is conducting a survey of companies that normally ship/receive commodity traffic through Lock(s) 27 at Upper Mississippi River mile 185.5. Your facility has been identified as one such company. If your company functions as a public terminal or transfer facility and is not the final user of the commodity traffic in question, we would appreciate it if you would share this survey form with your customer(s).

As you may be aware, the main lock chamber at Lock 27 was closed for repairs between July 26 and August 11, 2004. The smaller auxiliary lock chamber remained available to traffic during this period. During the closure period, companies whose waterborne commodity shipments/receipts normally transited Lock 27 were faced with some important challenges. Company responses to the closure were varied. Some companies stockpiled product and were able to continue to operate despite the situation at Lock 27. Some companies redirected their commodity traffic to overland modes. Still other companies re-directed production to other plants. All of the measures taken resulted in additional costs to the companies involved.

This survey has been initiated in an attempt to identify the actions taken and the total costs to industry associated with the closure event at Lock 27. An accurate assessment of the total costs to industry will provide important information that will bear on future repair, rehabilitation or other construction-related decisions regarding this important facility.

The attached survey questionnaire contains some fairly detailed questions aimed at identifying the measures taken and tabulating the costs. We would greatly appreciate it if you would examine the questionnaire and answer the questions to the best of your ability. A partial response is preferable to no response. Please bear in mind that any information provided will be treated as confidential and that participation in the survey is voluntary.

Participation in the survey demonstrates support for the continued, efficient operation of the navigation system.

Please return your completed survey form to this office by **March 28, 2005**. Should you have any questions regarding the survey, please do not hesitate to contact Ms. Sharryn Jackson of my staff at (309) 794-5309.

Sincerely,

Duane P. Gapinski
Colonel, U.S. Army
District Engineer

Enclosure

LOCK 27 CLOSURE SHIPPER SURVEY

Date: _____

Firm: _____

Address: _____

Phone: _____ FAX: _____

Point of Contact: _____ E-Mail _____

Title: _____

General Description of Firm and Products Produced: _____

NOTE: ALL RESPONSES WILL BE TREATED AS CONFIDENTIAL

1. Did your company have sufficient notice of the scheduled Lock 27 closure to prepare a response plan? (a) Yes (b) No

Comments: _____

2. During the period of closure of the main lock chamber at Lock 27, what was your company's response?

- ☐ a. No change in procedures.
- ☐ b. Stockpiled product and waited for Lock 27 traffic to clear.
- ☐ c. Switched to all-overland mode for product delivery from existing sources.
- ☐ d. Switched to different waterway routing for product delivery from existing sources
- ☐ e. Switched product source to an entirely new source.
- ☐ f. Ceased operations during the period of closure.
- ☐ g. Altered production during the period of closure.
- ☐ h. Switched production to another facility.

- ___i. Purchased intermediate or final product, rather than produced.
___j. Other or combinations of the above. (Please explain.) _____

Other Comments:

3. Which of your commodities and tonnages were affected by this closure?

4. If a reasonable estimate can be made, what additional costs (over and above normal operations) did you incur as a result of the closure event at Lock 27? If possible, please itemize according to the categories in question 2.

5. Has the closure at Lock 27 caused your company to alter its long-term transportation strategy (e.g. switch to all-overland modes, increase stockpiles, etc.)? How will this impact your total commodity transportation or other costs (per year). Please explain.

6. Has the closure at Lock 27 caused your company to take any other long-term permanent measures? (switch production to another facility, purchase intermediate or final product rather than produce, etc) Please explain. How will this affect your company's long-term operating costs (per year)?

7. Has your company been impacted by other navigation system disruptions? Did they influence your response to the Lock 27 closure?

8. Other Comments.

Note: The Corps of Engineers may not conduct and respondents need not respond to a survey questionnaire unless it displays a currently-valid OMB number. It is estimated that the information requested can be gathered in about 30 minutes.



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
ROCK ISLAND DISTRICT, CORPS OF ENGINEERS
CLOCK TOWER BUILDING – P.O. BOX 2004
ROCK ISLAND, ILLINOIS 61204-2004

<http://www.mvr.usace.army.mil>

February 25, 2005

Executive Office

Dear _____,

The Corps of Engineers is conducting a survey of the major carriers that normally use the Lock(s) 27 at Upper Mississippi River mile 185.5. Your company has been identified as one such company.

As you may be aware, the main lock chamber at Lock 27 was closed for repairs from July 26 until August 10, 2004. During the closure period, companies whose waterborne commodity receipts normally transited the Lock 27 facility were faced with some important challenges. Company responses to the closure were varied.

This survey has been initiated in an attempt to identify carrier reactions to the closure event. An accurate assessment of carrier reactions will provide important information that will bear on future repair, rehabilitation or other construction-related decisions regarding the Lock 27 facility.

We would greatly appreciate it if you would examine the questionnaire and answer the questions to the best of your ability. A partial response is preferable to no response. Please bear in mind that any information provided will be treated as confidential and that participation in the survey is voluntary.

Please return your completed survey form to this office by **March 28, 2005**. Should you have any questions regarding the survey, please do not hesitate to contact Ms. Sharryn Jackson of my staff at (309) 794-5309.

Sincerely,

Duane P. Gapinski
Colonel, U.S. Army
District Engineer

Enclosure

LOCK 27 CLOSURE CARRIER SURVEY

Date: _____

Firm: _____

Address: _____

Phone: _____ FAX: _____

Point of Contact: _____ E-Mail _____

Title: _____

General Description of Firm/Commodities Handled: _____

NOTE: ALL RESPONSES WILL BE TREATED AS CONFIDENTIAL

1. Did your company have sufficient notice of the scheduled closure at Lock 27 to prepare a response plan? (a) Yes (b) No

Comments: _____

2. How did your company operate during the scheduled main chamber outage at Lock 27?
Check as many items as are applicable and explain any unusual procedures.

___a. Barges were tied up at fleeting areas; towboats operated elsewhere in the system.

___b. Towboats remained in queue with barges.

___c. Towboats (light) held positions in queue.

___d. Tows were dispatched ready-to-lock at Lock 27.

___e. Tows were broken to lock through the auxiliary lock.

___f. Towboats (light) participated in industry self-help.

___g. Towboats tied off barges and participated in industry self-help.

___h. Company avoided the lock when possible.

___i. Other (Please explain). _____

Comments: _____

3. If a reasonable estimate can be made, what additional costs (over and above normal operations) did you incur as a result of the closure event at Lock 27?

4. Prior to the outage at Lock 27, towing industry representatives, in cooperation with the Corps of Engineers, developed some operating procedures that were put in place at the time of the closure. Do you believe this effort was (a) effective, (b) ineffective or (c) only partially effective? (Please explain)

5. Did the experience with the outage at Lock 27 cause your company to adopt any new operating procedures to accommodate lock outages elsewhere in the system? (Please explain.)

Note: The Corps of Engineers may not conduct and respondents need not respond to a survey questionnaire unless it displays a currently-valid OMB number. It is estimated that the information requested can be gathered in about 30 minutes.



The NETS research program is developing a series of practical tools and techniques that can be used by Corps navigation planners across the country to develop consistent, accurate, useful and comparable information regarding the likely impact of proposed changes to navigation infrastructure or systems.

The centerpiece of these efforts will be a suite of simulation models. This suite will include:

- A model for forecasting **international and domestic traffic flows** and how they may be affected by project improvements.
- A **regional traffic routing model** that will identify the annual quantities of commodities coming from various origin points and the routes used to satisfy forecasted demand at each destination.
- A **microscopic event model** that will generate routes for individual shipments from commodity origin to destination in order to evaluate non-structural and reliability measures.

As these models and other tools are finalized they will be available on the NETS web site:

<http://www.corpsnets.us/toolbox.cfm>

The NETS bookshelf contains the NETS body of knowledge in the form of final reports, models, and policy guidance. Documents are posted as they become available and can be accessed here:

<http://www.corpsnets.us/bookshelf.cfm>

